

## CLAIMS

## WE CLAIM:

1. A tool for limiting a cut on an impeller having a shaft and vane, the shaft including a bore extending therethrough, the tool comprising:
  - a shield having a sidewall, a top, and an inner cavity; and
  - one or more cut openings extending through the shield sidewall to the shield inner cavity,wherein the shield is configured to matingly receive the impeller shaft into the shield inner cavity and position at least a portion of the impeller shaft proximate each cut opening to thereby expose the portion of the impeller shaft for grinding.
2. The tool of claim 1, further comprising:
  - a central opening extending through the shield top to the shield inner cavity; and
  - a rod configured to insert through the central opening to adjustably move axially therein, the rod having at least a first end and a second end, the rod first end adapted to engage the impeller shaft bore.
3. The tool of claim 2, wherein the rod first end is threaded, and the tool further comprises:
  - a nut configured to threadingly couple to the rod first end.
4. The tool of claim 2, wherein the rod further includes a threaded second end and the tool further comprises:
  - a nut configured to threadingly couple to the threaded second end.

5. The tool of claim 1, wherein each cut opening is evenly spaced from one another.
6. The tool of claim 1, wherein the shield is made from Inconel.
7. A method for grinding an impeller shaft for balance comprising:  
positioning a tool onto the impeller shaft, the tool comprising:  
a shield having a sidewall, a top, and an inner cavity; and  
one or more cut openings extending through the shield sidewall to the shield inner cavity,  
wherein the shield is configured to matingly receive the impeller shaft into the shield inner cavity and position at least a portion of the impeller shaft proximate each cut opening to thereby expose the portion of the impeller shaft for grinding; and  
grinding the impeller shaft at the exposed portion of the impeller shaft.
8. The method of claim 7, wherein the tool further comprises a central opening extending through the shield top to the shield inner cavity; and a rod configured to insert through the central opening to adjustably move axially therein, the rod having at least first end and a second end, the first end adapted to engage the shaft bore, the method further comprising:  
inserting the rod through the central opening.
9. The method of claim 8, wherein the tool further comprises a first nut and a second nut, wherein the rod includes a threaded first end configured to couple with a nut, the method further comprising:  
coupling the nut to the rod first end.

10. A tool for limiting a cut on an impeller having a shaft and vane, the shaft including a bore extending therethrough, the tool comprising:
  - a shield having a sidewall, a top, and an inner cavity;
  - one or more cut openings extending through the shield sidewall to the shield inner cavity and a central opening extending through the shield member top to the shield member inner cavity; and
  - a rod having at least a first end and a second end, the rod configured to insert through the shield central opening,wherein the shield is configured to matingly receive the impeller shaft into the shield inner cavity and the rod first end is adapted to engage the impeller shaft bore and adjustably move axially therein, the shield further configured to position at least a portion of the impeller shaft proximate each cut opening to thereby expose the portion of the impeller shaft for grinding.
11. A method for grinding an impeller shaft for balance comprising:
  - positioning a tool onto the impeller shaft, the tool comprising:
    - a shield having a sidewall, a top, and an inner cavity;
    - one or more cut openings extending through the shield sidewall to the shield inner cavity and a central opening extending through the shield member top to the shield member inner cavity; and
    - a rod having at least a first end and a second end, the rod configured to insert through the shield central opening,
  - wherein the shield is configured to matingly receive the impeller shaft into the shield inner cavity and the rod first end is adapted to engage the impeller shaft bore and adjustably move axially therein, the shield further configured to position at least a portion of the impeller shaft proximate each cut opening to thereby expose the portion of the impeller shaft for grinding; and
  - grinding the impeller shaft at the exposed portion of the impeller shaft.